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# General Dutch population development 1400-1850: cities and countryside

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## Abstract

In this paper new estimates of the development of the population of the (northern) Netherlands in the period 1400-1850 are presented using many more or less recent estimates concerning regions and cities from numerous other authors. To add up these figures they have been interpolated to obtain annual estimates. This procedure resulted in estimates for the population of every town and for the rural parts of most of the provinces. Missing data have been extrapolated using trends of comparable regions. A distinction has been made between cities (with legal town rights) and countryside, and between coastal and inland provinces.

Already around 1400 the Netherlands were heavily urbanized, with about a third of the population living in towns. Differences in urbanisation between coast and inland were limited. However, the coastal region (Holland) experienced a phase of rapid urbanisation between 1500 and 1650 related to the Dutch Golden Age, resulting in urbanisation-rates of over 55%, while the inland urbanisation-rate was slowly decreasing. In the countryside, the coastal population increased also quite rapidly between 1500 and 1650, whereas the inland regions showed only a gradual increase. In general, the centre of gravity shifted in this period from the inland to the coastal region.

After 1700 an extraordinary long phase of de-urbanisation started in the coastal region, while the slow inland de-urbanisation continued. The Dutch urbanisation-rate fell from 46% in 1700 to 37% in 1850. In most of the eighteenth century the Dutch population stagnated. From the end of the eighteenth century onwards, however, population started to increase again. This increase, mainly originated from the countryside as in the inland regions the rural population began to grow rapidly. The relative shift in population after 1650 from town to countryside and from coastal to inland accompanied a shift in the economy from industry and services to agriculture in the early nineteenth century.

## Introduction

In recent Dutch historical literature the estimates of the early-modern Dutch population for every 50 to 100 year from Faber and the Wageningen research group of Slicher van Bath (Faber e.a. 1965) are still being used widely (among others: De Vries and van der Woude 1995, p. 71; Bieleman 2010, p. 38). There have been some attempts to come to new estimates using alternative methods (especially Nusteling 1989 who, however, also uses the

Wageningen figures as a starting point). However, these results are not completely convincing, so they did not become generally accepted. The Wageningen population figures were actually tentative estimates based on a limited number of provincial and regional population figures constructed by this research group, who was specialized in in-depth regional social-demographic studies of the countryside. The Wageningen figures offer some indications of the population size, but the authors admitted that they were quite uncertain, what is also shown by the large interval which is given for every estimate.

There are several good reasons to look again at these old Dutch population estimates. First, in the last half a century a large number of new population estimates of larger and smaller parts of the Netherlands have been published, which can be included in the estimates of the total Dutch population. Second, because of the enormous increase in digital possibilities and the accompanying rise in calculation power it has become much more simple to make annual estimates using the basic data material, which are at the same time also more precise. Third, the computer makes it also possible to refine the Wageningen method of adding up regional and provincial developments, through the making of a distinction between towns and countryside, and between the Dutch coastal area and the more inland parts of the Netherlands. The economic structure and the economic development of these two parts were quite distinct in the early-modern period, what makes it probable that the population development also differed significantly.

This contribution wants to offer a first attempt to come to new estimates of the Dutch population between 1400 and 1850.<sup>1</sup> I am aware that the quality of these estimates can still be increased significantly. First, the division in comparable regions can be refined further, as at the moment only provincial frontiers have been used to separate regions. Second, local listings of the number of baptisms, funerals and marriages could be used to refine the developments from year to year (compare: Nusteling 1989; Nusteling and Van der Weegen 1984), although Wrigley and Schofield's (1981) backward projection method (see also Oeppen 1993) using also this kind of data seem to offer only limited prospects for the whole of the Netherlands, due to the high religious diversity and the absence or low quality of local parish registration in the seventeenth century and before. Third, the number of local and regional estimates of the population-size can be increased through large scale research in sources. Fourth, the estimates of population-size in literature have been used as a starting-point of our estimate, although there are large differences in estimation techniques used, for instance on the assumptions on the average size of each household.

Next, the used method will be explained. In the following section we will present the newly estimated population numbers, afterwards we will briefly discuss what they mean for the Dutch development in the very long run, concentrating on the differences between the development of the rural and the urban population, and on the difference between the early modernizing and capitalistic coastal region (including Holland with Amsterdam) and the more moderately developing inland area. In the Appendices, the used data material and the choices made are presented and discussed in more detail, and the estimated figures will be presented.

## Method

As a starting point a large bunch of more or less recent estimates of the population development in several Dutch regions and cities from the fourteenth century onwards from

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<sup>1</sup> In DeVos, Lambrecht and Paping (2012, p. 159-160) some provisional results have been published.

numerous other authors have been collected (see Appendices A and B).<sup>2</sup> Unfortunately, these estimates usually relate to very diverging years. It is only the census of the years 1795-1796 (published: Ramaer 1931) that offer the first quite reliable estimates for the population-size of the whole of the Netherlands. This census has been used as an anchor point for the geographically and in quality strongly diverging late medieval and early-modern regional estimates. From 1795 (mainly Oomens 1989<sup>3</sup>) onwards abundant information on Dutch population figures is available. Population censuses have been held on a more or less regular base, for instance in 1809 (De Kok 1964), 1814, 1829, 1839 and 1849 (Oomens 1989). The accurateness of the resulting figures can be criticized (see for example Nusteling 1985, p. 249-250). However, it is beyond doubt that they in general give a very good impression of the development of the Dutch population-size in the first half of the nineteenth century (for overviews of the period after 1795 see for instance Hofstee 1978; Hofstee 1981; Engelen 2009). An important merit of these population figures is that they are available for every municipality, and sometimes even for every village.

There are two different reasons to stop this analysis in 1850. Looking at the sources, there is an enormous amount of very reliable and very detailed population figures from nearly every geographical level available, from 1850 onwards (for instance: NIDI 2003), which makes it possible to answer a broad range of detailed demographic questions (Kok 2014). So, offering new estimates is not of much use, although it has to be admitted that with this argument an end year of 1815 could also be defended. However stopping in the year 1850 is also attractive, because by that time the rather peculiar Dutch de-urbanisation process - starting more than a century before - came to an end. Recently, this de-urbanisation process has been put forward as one of the main characteristics of the Netherlands in the period 1750-1850 (Brusse and Mijnhardt 2011). The starting year 1400 is mainly chosen for practical reasons. The available older figures are scarce, and the resulting estimates for the years before 1400 would become rather weak.

For our estimates we have made a very strict distinction between the rural and the urban population. It is possible to make this distinction thanks to the work of Lourens and Lucassen (1997). They have made an enormous effort to assemble as many estimates of population-sizes of towns from years before 1800 in literature including the census figures of 1795 for cities. To this information they added their own estimates for several specific years for every town or city (1400, 1560 and 1670). The database of Lourens and Lucassen makes it possible to roughly estimate the population development of each town separately. In general we follow what Lourens and Lucassen calls towns. The difference between towns and cities is not relevant for the Netherlands, both are in Dutch called “steden”, or singular “stad”, so we will use both words as synonyms. Lourens and Lucassen’s data on population-size has been supplemented with a lot of extra information from very diverse publications (see Appendix A).

Towns or cities are defined as coherent settlements whose inhabitants have received specific legal rights called town or city rights, for instance to hold regular markets, to have their own legal system, to levy their own taxes and/or to build defence walls surrounding the place. These rights are in most instances based on a town or city charter that has been issued by the local or national sovereign. Most Dutch towns received such rights in the thirteenth to

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<sup>2</sup> At the moment this process is still partly underway, although the most important data already have been included. Not all the data from the scattered local and regional literature has been processed, especially not for the countryside. Consequently, the estimates presented still have a preliminary character.

<sup>3</sup> For the provincial figures, however, with some corrections because of for instance the changes in frontiers.

fifteenth century, only a few in earlier centuries or in the sixteenth century.<sup>4</sup> Special cases are also those towns who received these rights around 1800 during the French regime and the early kingdom of the Netherlands (see for them Appendix A).

We deliberately did not use a population criterion to define a place as an urban settlement, although this is rather usual in literature (for instance De Vries 1984). There are several very good reasons not to adhere to this tradition. To call a settlement a city because of its population-size is rather arbitrary. Where are you going to draw the fixed line, with 5,000, 10,000 or even 100,000 inhabitants? Is a settlement with 5,100 inhabitants suddenly urban, whereas at the same time one of 4,900 is not? Also the very general rise in human population in the last centuries, automatically will result in more settlements passing a fixed line, and because of this in rising urbanisation-rates according to such a definition. Actually, the choice for using population-size as an indicator for the urban nature is usually done for pragmatic reasons. It is much more easy to collect population figures of (the limited number of) places with usually a high number of inhabitants. Consequently, the chosen minimum number for a city is usually rather high in literature, what results in a complete disregard of smaller cities. However, the overwhelming majority of medieval and early-modern towns did not even count 5,000 inhabitants, despite their clear urban nature.

Ideally, we should compare the number of people living in an urban social, political, cultural and economic environment with those living in a clearly different rural social, political, cultural and economic context. The differences in these respects between larger and smaller ‘official’ cities are often much more limited than the differences between small official cities and most of the villages in the countryside. At least in the Netherlands, most small towns are to a considerable extent just miniature large cities.

Of course, it has to be admitted that some of the settlements receiving city rights have failed to develop into places with many urban characteristics accumulating a wide range of central functions for the neighbourhood. However, their number are in the Netherlands rather limited, and their population is quantitatively of minor importance. In our analysis some have been considered to be part of the countryside.<sup>5</sup> Slightly more important are those rural settlements who in the early-modern period accumulated more urban – mainly economic and social – characteristics. As in most of this period due to the lacking of a sovereign principal, no city-rights were issued, these settlements had to remain villages officially. Examples are the so-called “vlekken” in Friesland (for instance Drachten, Heerenveen and Joure). Similar settlements can be found in North-Brabant (Tilburg and Oosterhout), but also the government centre Den Haag (‘s-Gravenhage) in Holland, did not receive official city rights in the medieval period. With the exception of Den Haag, these rather urban villages are for our analysis reckoned to be part of the countryside, mainly because we lack data on their population development for most of the period.

The surface of the present day country of the Netherlands has been divided into two clear regions of about the same size: coast and inland. For the sake of simplicity we used the frontiers of provinces as demarcation lines. The coastal provinces are Holland, Zeeland, Friesland en Groningen, whereas the inland provinces are Drenthe, Overijssel, Gelderland, Utrecht, North-Brabant and Limburg. This division coincides with some specific physical-geographical characteristics, the inland parts of the Netherlands were for instance mainly characterized by sandy soil, while the coastal parts largely consisted of clay soil.

These physical-geographical differences were to a large extent accompanied by clear distinctions in the economic and social structure, especially in the countryside (DeVos,

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<sup>4</sup> Settlements that received city rights between 1400 and 1500 were included in the estimates from 1400 onwards for the sake of simplicity. This does not distort the picture to a large extent, as these settlement usually already had quite urban characteristics by that time, or else inhabited only a limited number of people.

<sup>5</sup> See Appendix A for more details, on which cities we did not include.

Lambrecht and Paping 2012). The agriculture in the coastal area seems at least in the early-modern period much more market-oriented than the inland agriculture. Main aim of the coastal farmers and peasants was the production for the regional, national and sometimes even international market. The inland farmers and peasants were more oriented towards food provision of their own household, although even here large surpluses were sold on the local, regional or national market. The large majority of the inland households were directly involved in small-scale agriculture, having some arable land at their disposal and a little cattle. In the coastal region, however, we see a large degree of complete specialisation in non-agricultural activities, and the existence of a large group of nearly completely landless labourers. When these large differences between coastal and inland parts came into being is not fully clear. While existing already in the seventeenth century, these differences must have a much earlier origin.

Unfortunately, the above mentioned differences do not fully coincide with the province frontiers. Also it has to be taken into account that the differences were not always as absolute as sketched above. In practice, transition areas existed with characteristics more or less in-between those two models. The most outstanding example is the province of Utrecht, which can also be seen as an intermediate zone between inland and coast. Nearly all Dutch provinces comprise of small parts which would better fit in the other model. In this respect we can mention sandy regions as Westerwolde, Stellingwerf and Gooi in respectively coastal Groningen, Friesland and Holland. On the other hand northwest Overijssel, northwest Brabant and the river clay area of Gelderland are much more market-oriented than the rest of these provinces and fit probably better into the coastal socio-economic model.<sup>6</sup>

The estimation procedure we used to come to general population figures is rather simple. For as many regional entities as possible annual estimates were made using interpolation. In most cases estimates for certain years in the period before 1795 are available in literature.<sup>7</sup> These figures were interpolated assuming constant percentage growth in the years in-between. For all cities we can derive estimates for the years 1400, 1560 and 1670 from Laurens and Lucassen (1997), who also offer information on the population-size of 1795 (see Appendix A).<sup>8</sup> The level of estimation for the countryside diverges, depending on the detail of the available information in the literature (see Appendix B). Some provincial and regional population-estimates also include the cities, which in that case have been deducted using the estimates for the different cities just mentioned. Often we have only information on the development of a part of the countryside of a province in a certain period. In that case missing data have been extrapolated using information on the population development of comparable regions. In several instances we had to assume that the population development in the part of the province for which we had figures was representative for the whole province. If we lack all data for the countryside of a province in a certain period, we assumed that the rural population in this province developed similar as in the other provinces in this specific part of the Netherlands (either inland or coastal).

The result of this procedure is that we by adding up all micro figures can make more or less independent annual estimates of the population for four regions: 1. the rural coastal region; 2. the coastal cities; 3. the rural inland region; 4. the inland cities. From 1795 onwards the same procedure has been applied, using the available census data for 1795, April 1809, end 1814, November 1829, November 1839 and December 1849 which all have been

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<sup>6</sup> A further refining of the estimation procedure could also take these regional differences into account.

<sup>7</sup> For the sake of simplicity we assumed that all estimates relate to the situation at the end of the year.

<sup>8</sup> If it is clear that Laurens and Lucassen (1997) estimates for these years actually relate to a nearby year (for instance 1398 instead of 1400), we used only the figure for the nearby year 1398 in our interpolation procedure.

assumed to relate to the end of the year. In Appendix C we present the provisional figures with breaks of 50 year for all provinces.<sup>9</sup>

### **Economic and political background**

Around 1000 the area of what is now the Netherlands was nearly completely rural with possibly only about 5% of the people living in urban settlements as Utrecht, Tiel, Nijmegen, Maastricht, Dorestad: mostly small towns situated in the sandy inland part. By that time it was a rather peripheral part of the Holy Roman Empire (of the German nation), from 962 onwards the predecessor of the Carolingian Empire. Today Netherlands (just like today Belgium, northern France and nearby parts of Germany) was divided in several small political entities. Taking into account the rises of many new cities, Dutch population must have increased rather rapidly to ca. 800,000 in the centuries before 1400.<sup>10</sup> The fall in population owing to the Black death from 1347 onwards seemed to have had relatively fairly limited consequences on the population in the Netherlands in the long run.

Especially in the second half of the 12th and 13th century rapid urbanisation took place. Firstly, villages grew in size, accumulated non-agricultural functions and obtained municipal rights (DeVos, Lambrecht and Paping 2012). Secondly, new and old cities were presumably not capable of growing themselves and a continuous stream of rural migrants was necessary to secure their growth. Nevertheless, between 1000 and 1350 not only the urban part, but also the rural part of the population increased, although much slower. This fast urban growth resulted in an extremely high urbanisation rate of more than 30% in 1400 throughout nearly all of the Netherlands, making it one of the most urbanised regions of the world.

The coming into being of numerous small towns in this period suggests a strong drive to specialisation of economic activities. More proper markets for products, labour and land started to develop (Van Bavel 2010). At the same time a rapid growth took also place in the countryside, where groups of scattered houses changed into genuine villages with a large stone church, that was often build in 12th or 13th century.

In this period the Low Countries also experienced a slow political consolidation process. Main political states were the County of Holland (including Zeeland), the Duchy of Brabant (controlling also parts of the today province of Limburg and large territories in present day Belgium), the Bishopric of Utrecht (controlling also Overijssel and Drenthe), the County later Duchy of Guelders (covering Gelderland and parts of Limburg) and more or less sovereign Frisian lands in Friesland and what is now called Groningen, two regions that became increasingly dominated by the independent city of Groningen (see Map).

Already in the late Middle Ages a remarkable socio-economic distinction existed between the coastal and the more inland regions in the Netherlands. The coastal region consisted mainly of fertile clay land, that was nearly all cultivated and can be characterized by 1500 as a specialised commercial society in which market production was of prime importance and the old feudal nobility played only a relatively limited role. Within the coastal region Holland and Zeeland were highly urbanized and needed to import grain, whereas in the countryside small freehold livestock farmers were performing a lot of (proto-industrial) non-agricultural wage labour. Groningen and Friesland were less heavily urbanised, but by the end of the Middle Ages the countryside was increasingly dominated by large leasehold farmers,

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<sup>9</sup> For the countryside we did not differ between present North- and South-Holland, as the division of this province in the early modern period was completely different.

<sup>10</sup> Van Bavel (2010) p. 36, for instance, estimates the population of the whole of the Low Counties (so including the presumably more populous Belgium) in 800 at 310,000 and in 900 at 410,000.

wage workers and specialised non-agricultural workers (a structure that by the way also could be found in the rather small river clay area of Gelderland).



Map: 1. Friesland; 2. Groningen; 3. Drenthe and Overijssel; 4. Holland; 5. Utrecht; 6. Guelders; 7. Zeeland and 8. Brabant.

The inland region consisted mainly of sandy land and was less fertile, very large stretches of land were only cultivated to a limited extent (commons). In the countryside a kind of peasant society existed in which all households had some land at their disposal (whether freehold or lease) and were performing subsistence farming with surpluses going to markets. Nobility was still of large importance and some feudal obligations remained in existence for a long period. In the more densely populated areas proto-industrial activities in textile production were of large importance. In the eastern inland parts (Drenthe, Overijssel, parts of Gelderland) the trading Hanse-towns flourished in the thirteenth and fourteenth century. The southern inland parts (in particular Brabant) were part of the flourishing southern Low Countries, with rural and urban textile and countryside. In the countryside numerous small (often freehold) peasants could be found.

At the end of the Middle Ages a political unification process took place, first under the Dukes of Burgund and later under emperor Charles V, which started from Flanders (occupying also a small part of present day Zeeland). In 1430 Brabant and in 1433 Holland and the rest of Zeeland were added, while in 1524 Friesland, in 1527 Utrecht, in 1528 Overijssel, in 1536 Drenthe and Groningen and in the end in 1543 Gelderland came under Habsburg control. In 1543 nearly all of the present Netherlands were ruled by the Habsburgs that immediately started to centralise the administration of the Low Countries.

This centralisation, combined with higher taxation, heavy religious tensions and oppression resulted in the start of the Dutch rebellion in 1568 against Philip II, the king of Spain. The revolt actually had in many respects more similarities with an ordinary civil war

between Roman-Catholics who were often inclined to support the king and Protestants who supported the rebellion. Already at the end of the sixteenth century a large part of the present Netherlands were controlled by what was then the Dutch republic. In the first half of the seventeenth century the rule over most of the rest was established. Only tiny parts of in particular the present province of Limburg, but also of Brabant and Gelderland remained outside the Dutch Republic.

Despite all political turbulence, the Dutch Republic developed in the sixteenth century, into the most wealthy country in terms of GDP per capita in the world (for instance: De Vries and Van der Woude 1995). This wealth, however, was mainly concentrated in the coastal region, especially Holland and Zeeland, and to a lesser extent Friesland. The enormous Dutch economic success clearly originated in previous centuries (Van Bavel 2010), a period in which a relatively strongly market-oriented economy developed with comparatively well-protected property-rights. After the Dutch Golden Age that ended in the last quarter of the seventeenth century, the development of the Dutch economy was characterized by stagnation on a very high level until the nineteenth century. Taking into account estimates for GDP per capita, it was only around 1800 that the Netherlands were surpassed by Great Britain.

### **Results: total Dutch population (comparison with earlier estimates)**

Not surprisingly, the new estimates differ only to a limited extent from the major previous ones (graph 1 and table 1). The differences with very rough tentative estimates of McEvedy and Jones (1978) are the largest, especially for 1400. However, a low population number for the Netherlands in 1400 of 600,000 seems highly implausible, taking into account an estimated urban population of 250,000 (Lourens and Lucassen 1997) and some 140,000 rural inhabitants in the province of Holland alone.

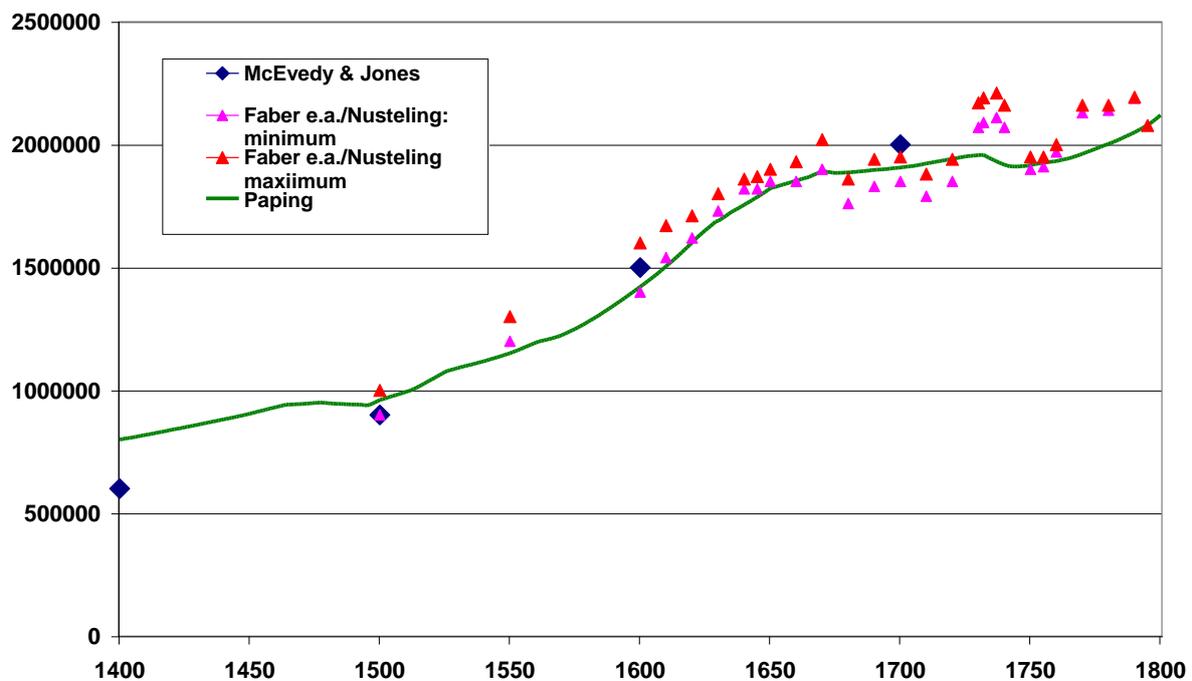
*Table 1: Estimates of the population of the Netherlands 1400-1849 (thousands)*

	New estimates	Faber e.a. (1965)	McEvedy&Jones (1978)
1400	800		600
1450	905		
1500	960	900-1000	900
1550	1150	1200-1300	
1600	1420	1400-1600	1500
1650	1825	1850-1900	
1700	1905	1850-1950	2000
1750	1915	1900-1950	
1795	2077	2078	
1849	3057	3057	

The differences with the old standard estimates of the Wageningen group of Faber e.a. (1965) are just small. Most of our point estimates fall in their estimation range. Differences appear only for the years 1550 and 1650, when our estimation results are slightly lower, while our estimate for 1600 is near the minimum suggested by them. Consequently, population growth was slightly lower in the first half of the sixteenth century, whereas it might have been somewhat higher in the second half of the sixteenth century and in the seventeenth century. In general, we calculate the total Dutch population to have been lower shortly before and during the Dutch Golden Age. It has to be stressed again, however, that the differences are not large.

The differences with the Nusteling (1989) figures based on interpolation, building on the Wageningen estimates are larger (graph 1). His method of using Amsterdam developments as an indication (after correction) for developments in the Netherlands as a whole, results in much more volatility in his figures than in ours, especially in the eighteenth century. Especially for his very high estimates for the second quarter of the eighteenth century (considerably above 2 million inhabitants), and again in the period 1770-1780 we do not find a lot of proof in our data. Our estimates show a small rise until 1735, followed by a very limited downturn until 1750, afterwards population resumed again, to accelerate a little during the second half of the eighteenth century. However, it has to be admitted that the estimation procedure used here, which involves a lot of interpolation over long periods of time, inevitably leads to a rather smooth series of population figures, as short-term changes, for instance due to epidemics and war-fare are mostly not taken into account.

**Graph 1: Dutch population 1400-1800: a comparison with earlier estimates**



Keeping the last remark in mind, our estimates suggest a steady population growth in most of the fifteenth century of 20%, followed by stagnation in the last decades of that century. Dutch population growth really accelerated after 1500. This very substantial rise went on until about 1670 and resulted in a near doubling of the total population. The relatively highest increase happened in the first half of the seventeenth century. In this period the Dutch Republic was still in war with Spain, but in the meantime managed to develop into the main trading power of the world, and to get the control over extensive regions in East-Asia and South-America, but also elsewhere outside Europe.

Around 1670 Dutch population growth diminished, though did not completely come to an end until 1735. We already mentioned the small downturn between 1735 and 1750 and the resuming of population growth afterwards, which accelerated after 1790, and even more after

1810, resulting in an average annual population growth of nearly 1% from 1820 onwards. The high annual growth in the first half of the nineteenth century (1800-1810: 0.4%; 1810-1820 0.7%; 1820-1830 1.2%, 1830-1840 0.9% and 1840-1850: 0.7%) happened despite several severe malaria epidemics in the coastal region, and 23 some cholera epidemics (Hofstee 1975), while the potato blight in the years 1845-1847 also had significant demographic consequences on both the number of deaths and births (Paping and Tassenaar 2007).

*Table 2: Estimates of Dutch population-growth per period, 1400-1849*

	Paping estimates	Faber e.a. (1965)
1400-1450	13%	
1450-1500	6%	
1500-1550	20%	(31%)
1550-1600	23%	(20%)
1600-1650	28%	(25%)
1650-1700	5%	(1%)
1700-1750	0%	(1%)
1750-1795	8%	(8%)
1795-1849	47%	

NB: For Faber we estimated the growth using the average of the minimum and maximum estimate.

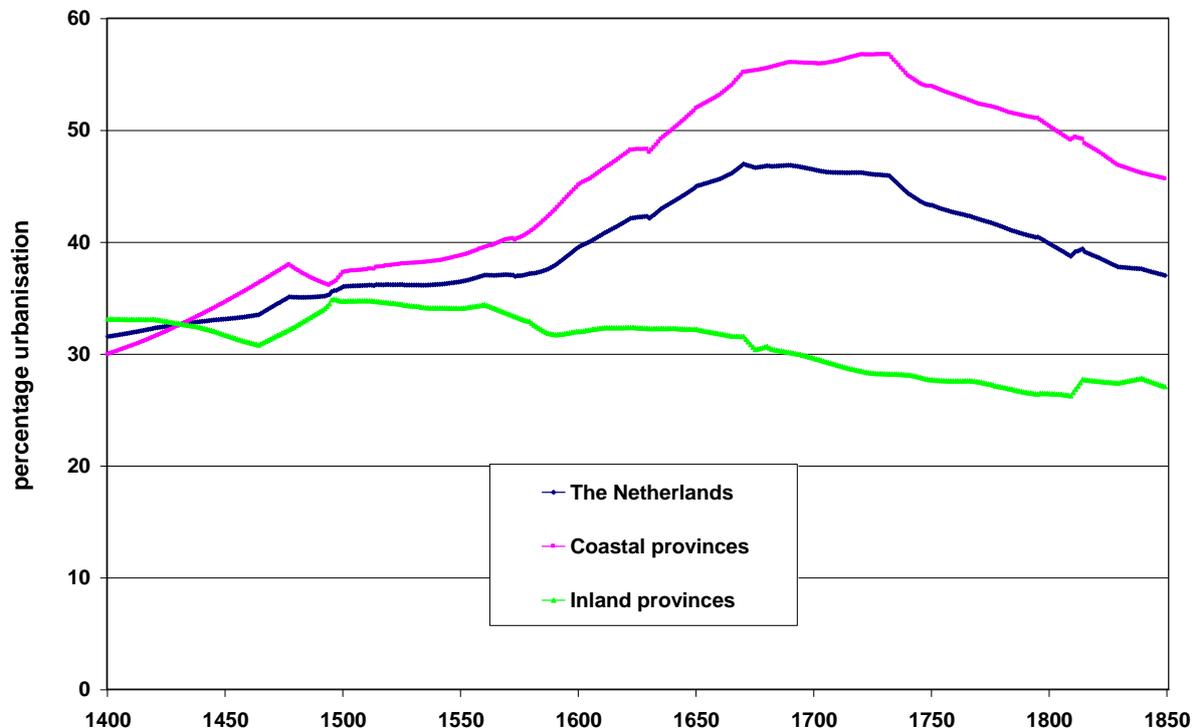
There has been some discussion on what the origin was of the relatively very high growth from 1800 onwards, whether a fall in mortality or a rise in fertility (partly in relation with falling ages at marriages) (for instance: van der Woude 1980; Hofstee 1978; Noordam 1986). It seems, however, likely that all these factors contributed to some extent to this move to a demographic system characterized by continuous relatively high population-growth. In the nineteenth and twentieth centuries the number of inhabitants of the Netherlands increased as a result more than eight fold until nearly 17 million by 2014, making it one of the European countries with the mostly rapidly increasing population. The main divergence between the Netherlands and the rest of Europe happened after 1850 (Engelen 2009; Karel, Vanhaute and Paping 2012) and lies beyond the scope of this paper.

## **Results: cities and countryside, coast and inland**

To international standards the northern part of the Low Countries stand out for its extreme high urbanisation rates, that already came into being in the twelfth and thirteenth century. High urbanisation must have had great consequences for the countryside. Villages were not isolated, but always part of a trading system, directed to feeding these cities. Autarkic agriculture must have been very rare, most of the ‘boeren’ (farmers and peasants) usually produced large surpluses for the market. For the rural population settling in the city must have been a reasonable possibility, small or large cities were nearly always to be found in near vicinity. Already around 1400 the territory of present day Netherlands was heavily urbanized, with nearly a third of the population living in legal towns. The large majority of these Dutch towns was, however, small or middle-sized, so they were not included in estimates measuring urbanisation using for instance 10,000 inhabitants as a yard-stick (compare table 3). As already noted before, the population of these smaller towns were economically heavily involved in the service and industry sector, and usually only to a limited extent in agriculture.

If we want to use the urbanisation-rate as an indicator of economic specialisation of the population of a country or region it seems necessary to also include these small towns.

**Graph 2: Urbanisation in the Netherlands, 1400-1850**



Differences in urbanisation between the coastal and inland region were only small around 1400. Actually, the inland was still on average the heaviest urbanised region by that time, as a consequence of the strong position of the Hanse-towns in Overijssel, while Den Bosch (North-Brabant), the city of Utrecht and Nijmegen (Gelderland) were the most populous cities of the northern Netherlands. However, already in the first half of the fifteenth century the urbanisation-rate of the coastal region surpassed the inland region, due to the rapid growth of the many Holland cities in that period. It lasted, nevertheless, until 1550 that urbanisation-rates of the two parts of the Netherlands began to diverge sharply. While the coastal region and in particular in Holland) experienced a phase of heavy urbanisation between 1550 and 1700, the urbanisation-rate of the inland region slowly decreased until less than 30%. Consequently, the centre of gravity in the Netherlands shifted in this period quickly from the inland to the coastal region.

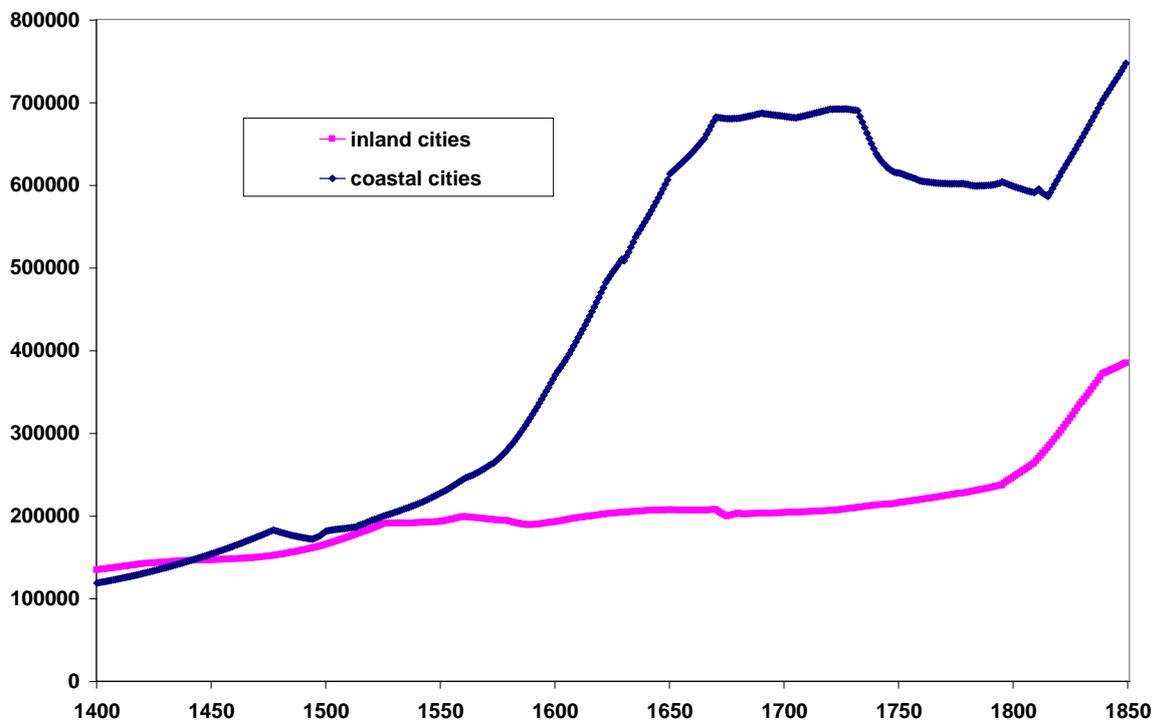
The heavy urbanisation of the coastal region was of course strongly related to the already mentioned Dutch Golden Age in which the Dutch Republic conquered the position of prime economic power of the world. This development resulted in urbanisation-rates of over 55% in the coastal region as a whole (and even more than 65% in Holland alone).<sup>11</sup> An economic structure came into being, which had no reminiscences anywhere else in the past.

<sup>11</sup> Van Bavel (2010) p. 281, estimates using more or less the same definition the urbanisation-rate of Holland at 33% in 1400; 45% in 1500; 45% in 1550 and 55% in 1600. If we compare this with our estimates: 34% in 1400; 45% in 1500; 45% in 1550 and 52% in 1600, Van Bavel puts the rapid urban growth slightly more in the second half of the sixteenth century, presumably at the expense of the first half of the seventeenth century.

The coastal region was heavily depending on food imports, especially cereals from the Baltic, to feed its enormous urban population. Local agriculture was very productive, but not being able to feed the whole coastal population it mainly specialised in livestock farming (especially in large parts of Holland and Friesland).

Graph 3 clearly shows the population explosion going on in the cities in the coastal region between 1525 and 1680 from about 200,000 to more than 680,000. Several demographic sources can be put forward for this tremendous growth in Holland in particular. It has been suggested that the sixteenth century was characterized by a relatively low average age at marriage resulting in many children, a high fertility and a high natural growth (Van Zanden \*\*\*). A strong rise of the migration from the local countryside to the cities does not seem to be a reasonable explanation, as the coastal countryside itself also experienced heavy population growth in this period. More important were presumably immigrants from elsewhere. We know that large groups of Calvinists fled from the southern Low Countries as this part came under the undisputed control of the Catholic king of Spain. The conquest of Antwerp in the southern Low Countries in 1585 by the Spanish was in this respect of utmost importance. Also numerous Jews from Spain and Portugal, but also from Eastern Europe settled in Amsterdam. Less exciting, but probably quantitatively more important was, however, a continuous stream of Germans and to a lesser extent of Scandinavians who were attracted by the enormous wealth of the Dutch Republic, and especially went in high numbers to the booming metropolis of Amsterdam (Hart 1976). Next, the coastal cities also took advantage of a stream of rural migrants from the inland Dutch provinces, a region in which population-growth was fairly limited as we will see.

**Graph 3: Dutch urban population, 1400-1850**



After 1730 an extraordinary long phase of de-urbanisation started in the coastal region, while the slow de-urbanisation in the inland region continued. There are not many other examples in

the world of such a prolonged period of de-urbanisation in recent centuries. The urban economic success model of the coastal part of the Dutch Republic based on a heavy dependence on the market-economy for the supply of goods and a corresponding strong specialisation in labour tasks had reached its technological limits. The Dutch proved not able to create enough innovations to sustain substantial economic growth by itself from the end of the seventeenth century onwards, while their markets were increasingly contested by some other countries, especially Great-Britain. The last economy was slowly catching-up with the Dutch, and was at the same time able to organize more resources in the long run. Its larger population-size was not only very important in political-military conflicts, but also formed an enormous absolute economic growth potential. Great-Britain (excluding Ireland) counted 6.4 million inhabitants in 1700 and 10.8 million in 1800 (De Vries 1984, p. 36), mainly living in the countryside, whereas the Netherlands inhabited hardly 2 million of people.

Only after 1850 Dutch urbanisation-rates started to increase again due to the modernisation of the economy, partly based on the import and application of technology from Great-Britain (industrialisation). Consequently, the whole Dutch urbanisation-rate fell from 46% in 1700 to 37% in 1850. The last figure it has to be remarked being still very high in international perspective and suggests that the old Dutch urban economic system was not completely swept away in the period before 1850. However, the economic system had been incapable to keep pace economically with both international general developments and national rural developments in the past one-and-a-half century.

Graph 3 clearly shows the fall in urban population in the coastal region after 1730. Already from the last quarter of the seventeenth century the population of many Holland cities started to decrease, but this was for a long time offset by the rapid growth of the city of Amsterdam. In a rapid concentration process, people left smaller towns in North-Holland like Enkhuizen, Hoorn and Monnickendam to settle in what had become by far the largest city of the Dutch Republic, rising from about 100,000 in 1620, to 175,000 in 1650, to 200,000 in 1665 and to 240,000 around 1730. From the fourth quarter of the seventeenth century Amsterdam alone inhabited more than ten percent of the Dutch population. Around 1730 even some 20% of the whole coastal Dutch population was living in the Dutch metropolis. In the next century, however, and especially in the first half of the nineteenth century the relative position of Amsterdam deteriorated significantly. Suggesting that even a system that concentrates its inhabitants to a considerable extent in one city could find its boundaries in the early-modern period.

As we include in our share of urban population also small cities, it is interesting to look at the effect of this unusual method. Table 3 gives a comparison with urbanisation-rates offered by De Vries (1984). If we compare the two estimates for cities with more than 10,000 inhabitants, the differences are limited. According to the new estimates Dutch urbanisation was, nevertheless, consistently slightly lower than calculated by De Vries, which is mainly a result from our use of sometimes lower urban population figures supplied by Lourens and Lucassen (1997), and of our excluding of Zaandam, which despite being an important industrial region near Amsterdam, did not receive proper city rights until the start of the nineteenth century. This is a situation that might have something to do with the rather widespread geography and the kind of rural character of the different parts of Zaandam.

Remarkably, there are very large differences in results between the two different methods to measure urbanisation, not only in respect to the level, but also to the development. Taking legal towns with an urban character whatever their size, results in much higher urbanisation-rates at least for the Netherlands. Looking at cities above 10,000 inhabitants suggests a much more limited importance of the urban way of living, especially for the late Middle Ages. What would, for instance be the effect on the urbanisation-rate for Germany, as the numerous small German cities would be included? The difference in 1400 and 1450 found

for the Netherlands between not even 5% people living in settlements above 10,000 inhabitants and more than 30% living in an urban environment is in that respect illuminating. Clearly, the first method of measuring underestimates the influence of towns in early-modern society enormously.

*Table 3: Dutch urbanisation-rates in comparative perspective, 1500-1800*

	Nether-lands (Paping) legal towns	Nether-lands (Paping) +10,000	Nether-lands (De Vries) +10,000	Engeland & Wales (De Vries) +10,000	Germany (De Vries) +10,000	Italy (De Vries) +10,000	Belgium (De Vries) +10,000
1400	31.5	4.7					
1450	33.1	4.3					
1500	36.0	12.3	15.8	3.1	3.2	12.4	21.1
1550	36.5	13.7	15.3	3.5	3.8	13.1	22.7
1600	39.5	23.6	24.3	5.8	4.1	15.1	18.8
1650	45.0	30.5	31.7	8.8	4.4	14.0	20.8
1700	46.4	32.9	33.6	13.3	4.8	13.2	23.9
1750	43.3	29.7	30.5	16.7	5.6	14.1	19.6
1800	39.8	25.7	28.8	20.3	5.5	14.6	18.9

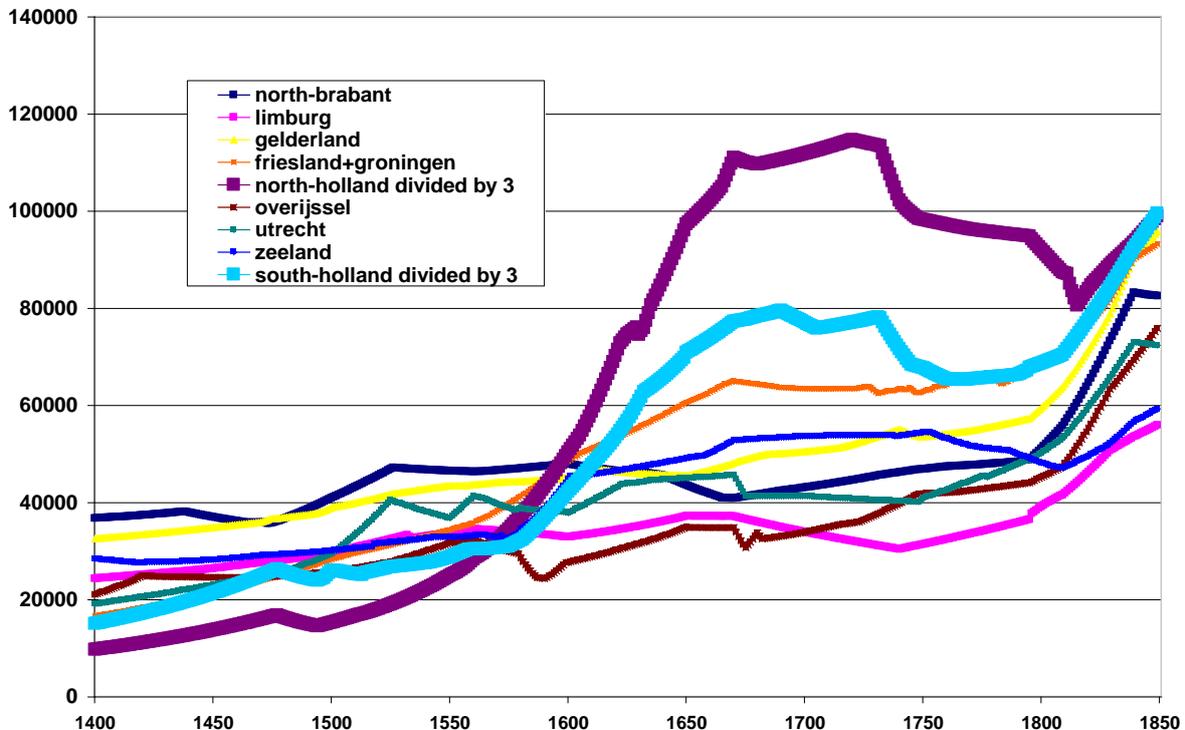
Source: This paper; De Vries (1984) p. 30, 36, 39. Except for the first column that takes into account settlements with city rights (see text), all figures relate to cities with 10,000 inhabitants or more.

Both measures of urbanisation show - at least for the Netherlands - also a very different development. Looking at legal towns, the urbanisation-rate increased from 31.5% tot 46.4%, or by about a half between 1400 and 1700. However, if we take only settlements with at least 10,000 inhabitants into account this results in a more than six fold increase in the same period from 4.7% to 32.9% (our figures). Not only the relative increase differs enormously, the same is the case for the absolute increase: a rise of 14.9% against a rise of 28.2% of people living in an urban environment. Even the fall in urbanisation between 1700 and 1800 was suggested to have been higher according to the plus 10,000 figures, due to some cities being no longer able to pass the 10,000 line. Remark that the difference in interpretation for the period 1550-1600 and 1600-1650 are large. Looking at all urban settlements, large and small, urbanisation increased most rapidly in the first half of the seventeenth century from 39.5% to 45.0%. However, if the 10,000 line is used, urbanisation seemed to have increased considerably more in the second half of the sixteenth century, as in that period many middle-sized Dutch cities managed to increase to such an extent to pass the number of 10,000 inhabitants (Leeuwarden, Alkmaar, Enkhuizen, Hoorn, Middelburg, Gouda and Rotterdam).

Despite the serious doubts the former analysis casts upon the method of looking only at cities of 10,000 inhabitants and above, table 3 makes clear that the Dutch urbanisation-rate was extraordinary to Western-European standards. Around 1500 only Belgium (the southern Low Countries) was significantly more urbanised than the Netherlands according to this measuring-rod. DeVos, Lambrecht and Paping (2011, p. 159-160), state that the level of urbanisation in the southern Low Countries (mainly Belgium) and northern Low Countries taking into account all towns was still about the same around 1400. However, the next century urbanisation in the south increased also. It was after 1550 that the northern Netherlands decisively took the step to becoming the most urbanised region of the world for centuries, surpassing both the territory of present day Belgium and of Italy. Although England also urbanised significantly in the early-modern period, it lay far behind the Dutch Republic. This

was still the case in 1800, although the gap was consistently decreasing in the last one-and-a-half century.

**Graph 4: Urban population by province, 1400-1850**

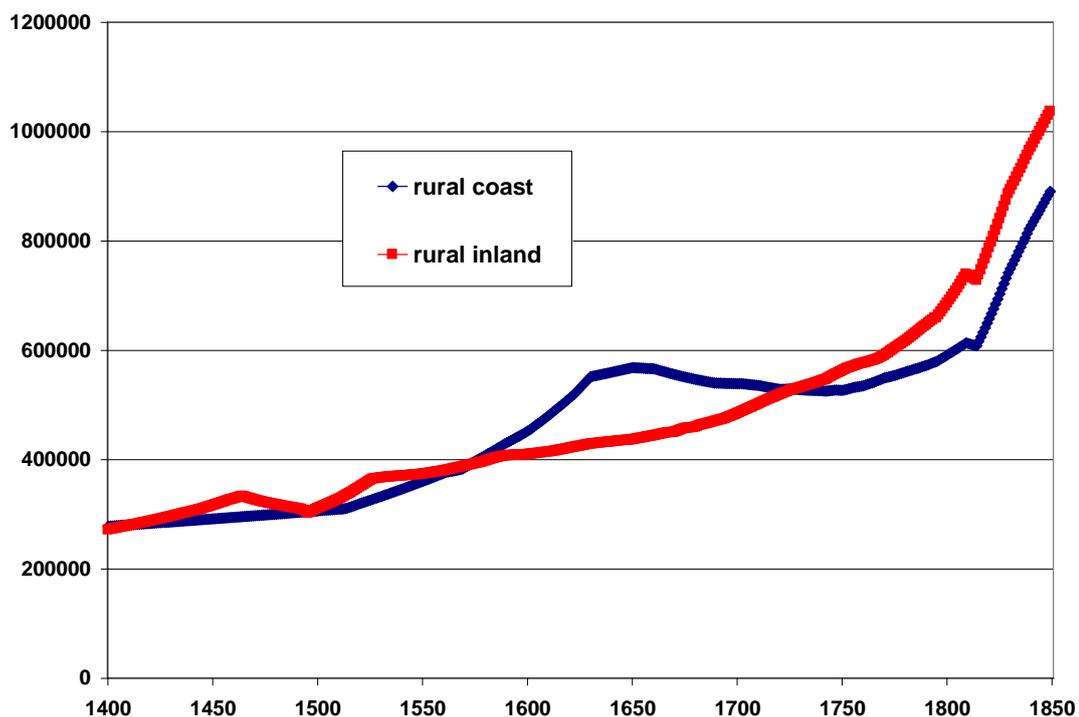


Graph 4 shows the estimated development of the urban population in the Dutch provinces. It is clear that the speed in the rise of population of the Holland cities in the period 1550-1650 dwarfed all increases anywhere else. Also it makes obvious that the driving-force behind the de-urbanisation after 1730 were mainly the shrinking Holland cities, as in most other provinces the urban population showed some increase, remained quite stable or experienced just a limited fall in the eighteenth century. In all provinces urban population growth accelerated at the end of the eighteenth century, with North-Holland clearly lagging behind. In North-Holland it was only after 1800 that the fall in urban population ended. An exception is also the growth of the urban population in Zeeland that was also relatively limited in the first half of the nineteenth century and corresponds with the developments in Holland.

The development of the Dutch rural population between 1400 and 1850 was much less volatile than that of the urban population. This was especially the case for the inland sandy region that, as mentioned, was characterized by an agriculture in which production for self-provision played a major role and by a relatively limited extent of occupational specialisation. Except for the second half of the fifteenth century, the population of the inland countryside increased slowly and continuously. Only in the first half of the nineteenth century population-growth accelerated. The inland process of population-growth resulted in a fragmentation of farmstead, and a rising share of cottagers with only a limited amount of land at their disposal. In some inland rural parts proto-industry became of growing importance for the livelihood of the inhabitants.

The development of the population of the coastal countryside was far less constant. From the second quarter of the sixteenth century, until the middle of the seventeenth century the rural population in the coastal parts of the Netherlands started to increase rather rapidly, although slower than the urban population. Clearly, not only the cities were booming, but also the coastal countryside took advantage from the economic success of Holland in this period. In the first half of sixteenth century rural Holland was still mainly characterized by small-scale agriculture (peasants) and many inhabitants were active in different kinds of proto-industrial wagework (peat-digging, dike-work, fishing and other maritime activities) to supplement subsistence farming (De Vries 1974; Hoppenbrouwers and Van Zanden 2001; Van Bavel 2010). In the next century, this economic structure seemed to have made way for one with more productive (and possibly also larger) market-oriented farms, and a rise in landless farm labourers and in household heads fully specialised in non-agricultural occupations (for instance as artisans, millers, merchants and sailors). Also large-scale draining projects in Holland in the period 1580-1650 will have made this rise in rural population possible, not only extending the amount of agricultural land, but also demanding a lot of labour for dike construction during the reclamation process. Interestingly, a specialised economy with a strong market-oriented agriculture seemed to have existed in the clay parts of the more peripheral coastal provinces of Friesland (Knibbe 2006) and Groningen already in the sixteenth century, well before Holland.

**Graph 5: Dutch rural population, 1400-1850**



After 1650 the coastal rural population began to stagnate, and in Holland this happened already from 1630 onwards. Possibly, this was caused by some economic activities moving to the cities, and especially to Amsterdam. The most important downturn with a quarter of the rural population happened, however, in Friesland in the second half of the seventeenth century. The nearby Groningen countryside escaped from this fate, presumably partly due to the growth of several large peat colonies in exactly this period, provoking a considerable influx of migrants in this period. In the second half of the eighteenth century the population of

the Groningen countryside also decreased considerably with nearly 10%. The falling prices of agricultural products from the second half of the seventeenth century until 1750, resulting in a strong decrease in land prices, will have stimulated the diminishing of population in these market-oriented societies. Migration to the coastal countryside became less attractive because of the economic distress, while it also seems not to have been a very healthy place to live in this period. Endemic malaria and several floodings might have resulted in a significant excess mortality (Paping 2001b), making a migration surplus necessary to keep the population at least at a constant level.

In these more peripheral parts of the coastal countryside, just as in Zeeland, population-growth resumed in the second half of the eighteenth century when agricultural prices again began to improve. At the end of the eighteenth century coastal rural population-growth accelerated as everywhere else. Even the Holland countryside experienced rapid population-growth in the first half of the nineteenth century, after one and a half century of stagnation or decrease. This growth was seemingly independent of the developments in the urban parts of the coastal provinces. The population of the coastal cities - although increasing again - lagged behind, signifying the growing role of Dutch agriculture itself as engine of economic growth from the second half of the eighteenth century onwards.

### **Concluding remarks: an overview**

Through a methodology that makes use of as many local or regional estimates as available, it proved possible to present new estimates for the development of the Dutch population, making a distinction between city and countryside, and also between the more market-oriented coastal provinces and the less market-oriented inland provinces. Although the presented estimates can be seen as a large step forward compared to the at the moment available figures, there is still much room for further improvement, what can result in even better estimates.

In the previous chapters we mainly concentrated on the development of the four different parts of the Netherlands distinguished in this paper. In these concluding remarks we want to end with discussing which of these parts of the Netherlands contributed mostly to the Dutch population-growth in different periods during the four-and-half centuries analysed here. Table 4 shows that there were important shifts. From 1400 tot 1500 Dutch population-growth was mainly concentrated in the coastal cities, although all other parts contributed to some extent. Interestingly, it was the coastal countryside which was lagging behind, suggesting perhaps a move of people to the city in this region. The first half of the sixteenth century - when overall growth was pretty large - stand out as the only period when differences between all four parts were fairly limited, though growth in the coastal cities was still largest.

In the century between 1550 and 1650 differences between the four parts suddenly became enormous. The overall Dutch population increase mainly originated from the growth of the coastal cities, and to a lesser extent the coastal countryside. Inland population-growth even was relatively low, especially in the inland cities, who seem to have lost the competition with the coastal cities completely. With the diminishing of the growth of the coastal cities in the period 1650-1700, one and half century of rather rapid Dutch population-growth came to an end. Between 1650 and 1800 the Dutch population stagnated, and it was the relatively traditional inland countryside experiencing slow but steady growth which contributed mostly to the rather limited overall increase. Differences in growth with two of the other parts became smaller in the second half of the eighteenth century. In the first half of the century the population-growth of the inland cities was even the largest, but differed not much from the

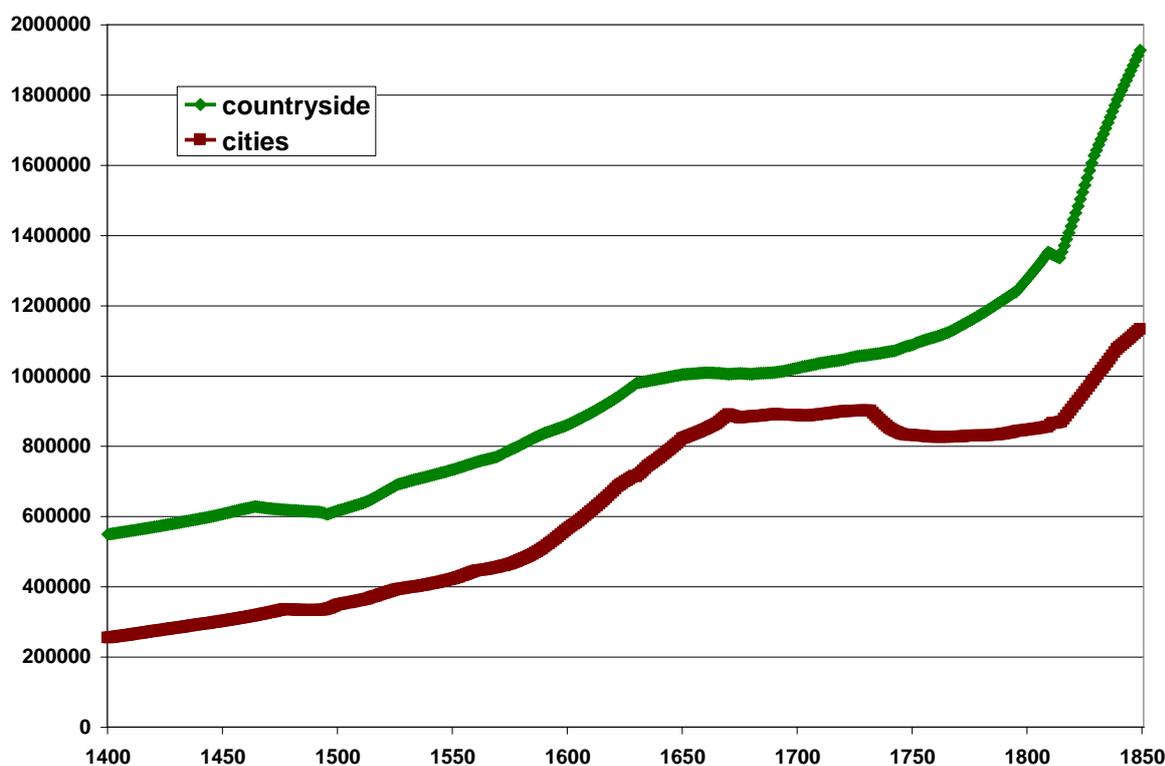
inland and coastal countryside. These inland cities took advantage of the rising importance of agriculture and of their position of governmental provincial centres in the newly in 1815 created kingdom of the Netherlands.

*Table 4: Division of Dutch population-growth per period, 1400-1849*

	total	Urban coast	Urban inland	Rural coast	Rural inland
1400-1450	13%	30%	9%	5%	16%
1450-1500	6%	18%	13%	5%	-2%
1500-1550	20%	25%	17%	18%	20%
1550-1600	23%	63%	-0%	26%	10%
1600-1650	28%	66%	8%	26%	7%
1650-1700	5%	11%	-2%	-5%	11%
1700-1750	0%	-10%	6%	-2%	16%
1750-1795	8%	-2%	10%	10%	17%
1795-1849	47%	24%	63%	54%	57%

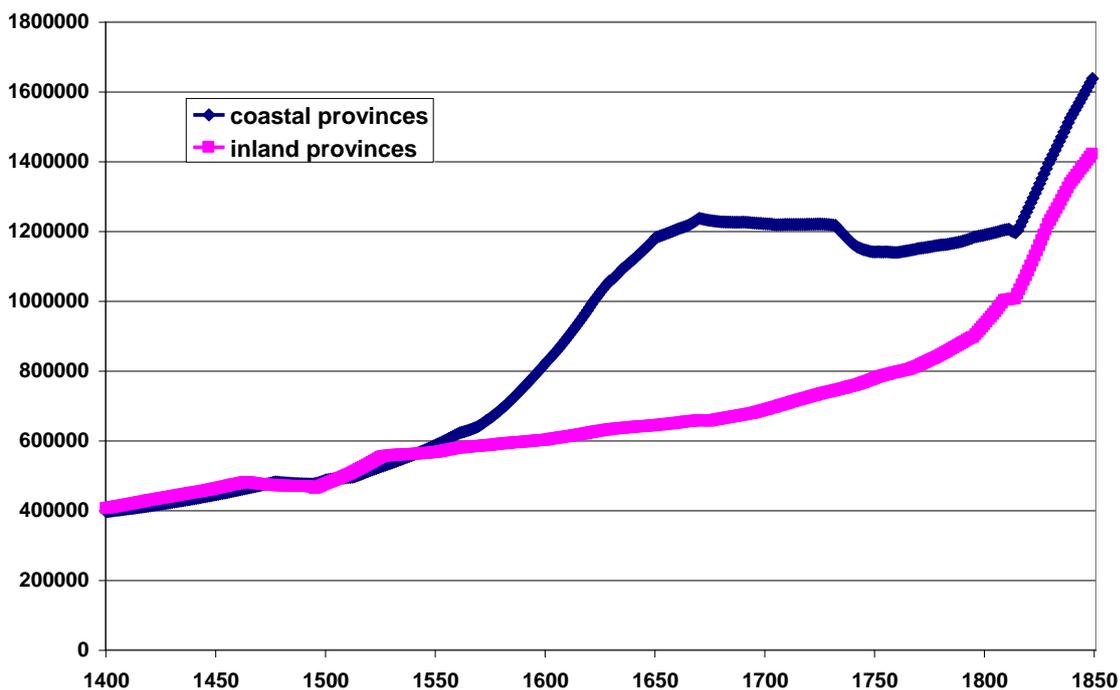
However, one part - the coastal cities - stands out, as these former engines of population-growth were really lagging behind after 1700. Knibbe (2010) shows that it were the traditional industry and trading centres of Holland (actually much of the core of the Dutch Golden Age) and to a lesser extent Amsterdam that were responsible for this. Only exception were the cities around the harbour of Rotterdam and the governmental centre of Den Haag. Small cities that acted as local agricultural trading centres were, on the other hand, flourishing in the period 1750-1850. Cities along the great rivers the Rhine and IJssel and the other scattered cities (partly the provincial capitals outside Holland and Zeeland) were also doing relatively well. Most of these cities were situated in the inland provinces.

**Graph 6: Total Dutch rural and urban population, 1400-1849**



Graph 6 again clearly shows what happened in general in the Netherlands during this long period, stressing the difference in urban and rural developments. Until 1650 the population of both cities and countryside was constantly growing, although the cities were growing at a higher pace. From the second half of the seventeenth century it was the countryside that contributed mostly to the Dutch population growth, while the urban population was stagnating and later on falling. Although the cities contributed somewhat, the acceleration of the population-growth in the first half of the nineteenth century was largely a rural phenomenon.

**Graph 7: Total Dutch coastal and inland population, 1400-1849**



In graph 7 the developments between the coastal and inland population have been compared. Until about 1550 both parts of the Netherlands largely increased in tandem and had more or less the same number of inhabitants. However, after 1550 developments started to diverge. The inland provinces continued their path of slow but continuous growth, with a real acceleration only from the end of the eighteenth century onwards. The coastal regions, however, experienced tremendous population-growth between 1550 and 1650, followed by a long period of stagnation and even decrease until 1800. The rapid population-growth of the coastal provinces in the first half of the nineteenth century was also lower than that of the inland provinces. Consequently, the shift in population backwards from coastal to inland had already started around 1650 and went on until after 1850. Nevertheless, this was not enough for the inland provinces to surpass the coastal provinces in absolute terms. Around 1850 still more people were living in the coastal provinces than in the inland provinces.

The relative shift in Dutch population after 1650 from town to countryside and from coastal to inland regions accompanied a slow silent shift in the economy from industry and services to agriculture, which eventually led to large agricultural exports in the nineteenth century, a peculiar characteristic where the heavily urbanised Netherlands are still famous of.

## Appendix A. Sources urban population estimates

Settlements with a very strong urban character in certain periods before 1850 that are missing in the overview work of Lourens and Lucassen are: Meppel, Assen (Drenthe), Delfzijl, Winschoten (Groningen), Oosterhout, Roosendaal, Tilburg (Noord-Brabant), Den Helder en Zaandam (Noord-Holland), Delfshaven and Maassluis (Zuid-Holland). These are places that usually only received in city-rights around 1800. In our analysis they have been reckoned to be part of the countryside. Some very tiny juridical towns did not become municipalities of their own in the nineteenth century: 's Heerenberg, Bredevoort and Terborg (Gelderland). Usually we also do not have much information on the development of their early-modern population, so they were also reckoned to be part of the countryside. The same is the case for the very small city of Stevensweert receiving only city-rights in 1722. In Overijssel there were a lot of very small towns, of which we reckoned Diepenheim, Grafhorst, Gramsbergen, Wilsum (all before 1800 500 inhabitants at most)<sup>12</sup> and Blokzijl (receiving city-rights in 1672) all were part of the countryside in our calculations. Vreeland (Utrecht), Valkenburg, Nieuwstadt and Montfort (Limburg), Sint Anna ter Muiden, Terneuzen en Philippine (Zeeland), and Geervliet, Goedereede en Heenvliet (South-Holland) were treated in the same way.<sup>13</sup> The city of Reimerwaal (Zeeland) disappeared, and presumably did not have an urban character anymore after the conquest by the protestant “geuzen” in 1573. The small cities of Arnemuiden (1574), Sas van Gent (became a fortress around 1580), Terneuzen (1584) and Sint Maartensdijk (1518) are younger than 1500, and have been included in the urban figures only from the mentioned years onwards.

We strived to include in our urban figures only the inhabitants in the cities themselves and not in the surrounding countryside. The census-data for 1815, 1829, 1840 and 1849, however, offer only information per municipality. Some urban municipalities also include large stretches of countryside. The rural part (often including some villages) of these municipalities has been estimated using the more detailed information of 1795 and 1809. For the period 1809-1850 it has been assumed that the population in these rural parts developed in the same way as the urban parts. It has to be remarked that very detailed information of the census of 1849 (CBS 1852/3) seem to make it possible to again distinguish between city and countryside. However, this would be a very time-consuming procedure, and would again result in large uncertainties as to what quarters nearby cities already should be called urban in this period of considerable population growth.

### Additions to the urban figures of Lourens en Lucassen:

#### *Gelderland:*

Huissen 1650-1795: Brusse (1999, p. 392).

#### *Groningen:*

City of Groningen: 1659: counting of register: 5000 houses is about 20.000 inhabitants (Doornbos and D.F. Kuiken 1993). Annual estimates for the period 1727-1795 using the number of baptisms and deaths (interpolation deaths 1736-1741: Trip 1867) and an annual migration deficit of 0.3%. Result is in accordance with the estimate of 1770 (Paping 1995, p. 311) and an estimate of 1721 (Lourens and Lucassen 1997: 20,680). It has to be noted that if we would use a fixed birth figure of 35 per 1,000 inhabitants the estimate of the population in

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<sup>12</sup> Compare also Slicher van Bath (1957) 9, who reckoned Grafhorst, Wilsum and Gramsbergen to be rural.

<sup>13</sup> Van deze zeer kleine stadjes zijn veelal ook maar heel weinig vermeldingen van inwonersaantallen bekend.

the first half of the eighteenth century usually would have been higher, and in the second half of the eighteenth century would have been lower. For the period 1700/1709 the estimate would have been about 21,000, and now it is a few hundreds lower. The estimates for 1522 (Prins 1994, p. 21): 16,000 inhabitants based on 12,000 attending the holy communion, and for 1567: 19,400 on the basis of counting houses on the old map of Jacob van Deventer (Schuitema Meijer 1976, p. 358) have not been used as presumably too high (compare Benders 2011, p. 16-18).

Appingedam: 1565-1603 (Benders 2011, p. 19). In the years 1500-1513, before the ransacking of 1514 Appingedam counted roughly 2,000 inhabitants, around 1623 circa 1.900 inhabitants, and in 1670 1,740 inhabitants assuming an average household-size of 4.1 (Paping 2001a). For the period 1708-1798 the population figure of 1795 has been extrapolated using tax-data on the number of artisans and shops, the result is in accordance with a separate estimate of 1,500 inhabitants in 1750.

#### *Holland:*

For Dordrecht we nearly always used the figures of Nusteling (1998, p. 72-81), which offers also some estimates for other cities in Holland. These data are for Dordrecht supplemented with Van Herwaarden (1996, p. 234-246). Figures on numerous cities mainly in Holland for a large number of years from 1300 to 1795 are supplied by Israel (1995, p. 114, 328, 621 and 1007), although sometimes diverging, they seem to have been solely based on older literature, and have not been incorporated separately in the database.

#### *North-Brabant:*

Kappelhof (2004, p. 530) supplies figures for some cities in North-Brabant in 1665, who have been (with the exception of Grave) used instead of those mentioned by Lourens and Lucassen (1997).

#### *Overijssel:*

Cities in Twente in 1682 en 1694 have been estimated using data on hearths and their development until 1748 from Trompeter (1997, p. 161-167). It has to be remarked that older figures of Slicher van Bath (1957, p. 54) give an urban population for Twente in 1475 of 3,500 while according to Lourens and Lucassen this would be about 4,900. Additional figures on Deventer, Kampen, Zwolle and also Zutphen in Gelderland 1500-1795 can be found in Holthuis (2010) 33.

#### *Utrecht:*

For the cities of Utrecht we supplemented Lourens and Lucassen (1997) partly with figures presented by Rommes (1997, p. 171), there are some inconsistencies between the different estimates for several cities.

#### *Zeeland:*

Priester (1998, p. 449-484) presents a lot of additional figures for cities in Zeeland. It has to be remarked that especially for Middelburg his figures are much lower than previous estimates. We used Priester's estimates: Middelburg 1601 15,500; 1626 15,300; 1702 16,500; 1786 18,300. We used his alternative estimates for Goes also.

## Appendix B: Sources rural population estimates

### *Drenthe*<sup>14</sup>

Bieleman (1987, p. 63-65, 68, 689-695) offers total population estimates for the years 1630, 1672, 1692, 1742, 1754, 1764, 1774, 1784, 1794 and 1804 for each village (including the only town Coevorden), while 1612 can be estimated at 17.984 inhabitants using the information that the number of households in 1612 was 82% of that in 1630 (p. 60-62).<sup>15</sup> In 1617 it is stated that 199 of the 1011 larger farmsteads, and another 54 other farmsteads who had existed traditionally – meaning before the outbreak of fighting in 1584 - were without a house or was not being used (Bieleman 1985, p. 327). Taking this into account population for the year 1580 is roughly estimated at 20,000. The total population in 1445 can be estimated at 10,405 comparing numbers counted from Alma (1997).<sup>16</sup> For the end of the thirteenth century Spek (2004, p. 591-592) estimates the population of Drenthe at 12,000-15,000, which would imply a considerable fall after 1350.

### *Friesland*

Faber e.a. (1965, p. 63-64): estimates total province for 1511 (rough 75,000-80,000), 1650 (guess 145,000-155,000, elsewhere 145,000), 1689 (minimum 129,000), 1744 (135,000), 1815 (173,000). All excluding the Frisian islands. Faber (1972, p. 412-413) offers slightly diverging figures for 1511 (72,000-80,000), 1650 and 1660 (both 147,000-169,000), 1689 (129,000-142,000), 1700 (127,000-135,000), 1714 (129,000-135,000), 1744 and 1750 (135,000), 1796 (157,000) and 1815 (174,000)<sup>17</sup>. The estimated rural population in 1511 of Faber (1972, p. 413) shows an interval (56,500-62,500). We used the middle as best guess, as we did for the other estimates, and we subtracted the population of the cities. The development of the population on the islands (less than 3%) has been assumed to develop in line with the rest of the rural population. For the estimates of 1689 and 1714 a correction has been made for some rural surroundings of Leeuwarden that were included in the urban figures (Lourens and Lucassen, 1997, p. 14).

### *Gelderland*

We at present have only any information on developments in three quarter of the province before 1795. The estimates for that part are assumed to be representative for the whole countryside.

Quarter of Zutphen (Achterhoek): Only parts are known: Figures for this area: 1470, 1492, 1494, 1496, and further estimates for 1499, 1506, 1512 based on numbers for even a more limited number of villages (Van Schaik 1987, p. 159, 272) in comparison with 1809. Estimate for 1795 is estimated extrapolating 1809 using the development in the whole countryside between 1795 and 1809.

Quarter of Arnhem (Veluwe): Figures including cities, who have been subtracted for 1526, 1650, 1749 and 1795 (Faber e.a. 1965, p. 92; Roessingh 1964). Unfortunately, the rather

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<sup>14</sup> Blok (1985) 170, estimates the number of houses in Drenthe in 944 to have been 610, suggesting a population of about 3,000.

<sup>15</sup> Bieleman (1985) 327, mentions also 16,000-17,000 inhabitants for 1612, a number which seems less convincing than the number estimated through extrapolation used here.

<sup>16</sup> Own estimate based on the development in the number of households in 16 parishes between 1445 and 1630. The 1445 list mentions taxable heads of households, the numbers have been raised with two for each parish for a noble house and a rectory, and with 10% for non-taxing paying pauper households.

<sup>17</sup> De Vries (1974) published quite simultaneously the following only slightly diverging estimates: 1511: 75,000; 1689 128,734; 1714 129,1243; 1744 135,133 and 1795 157,496.

fragmentary figures of Van Schaik (187, p. 161, 285-287) for the period 1463-1541 are not consistent with the estimate of 1526 as being much too low and so have not been used.

Betuwe: Figures for the whole area: 1770 and 1795. For the earlier period split (source: Van Bavel 1999, p.744, until 1470, and Brusse 1999, p. 29, 397-398 from 1630 onwards) into Tielerwaard, Bommelerwaard, Over-Betuwe and Neder-Betuwe. Tielerwaard: figures for 1369, 1382, 1470 and 1630. Bommelerwaard: figures for 1369, 1394 and 1630. Over-Betuwe: figures for 1369, 1470, 1650, 1677, 1710 and 1736. Neder-Betuwe: figure for 1369, 1394, 1470 and 1650.

Land van Maas en Waal: Figures for a part of the area 1369, 1382, 1387, 1397/8, 1500, 1541 (Van Schaik 1987). The estimate for 1795 is extrapolated from 1809 using the development in the whole countryside between 1795 and 1809.

Rijk van Nijmegen: Figures for a part of the area 1369, 1382, 1387, 1500 (Van Schaik 1987). The estimate for 1795 is extrapolated from 1809 using the development in the whole countryside between 1795 and 1809.

### *Groningen*

Jansen (1976, p. 127-128) estimates the population in the Groningen Ommelanden at 30,800 around 1300, and the city of Groningen at 5,000-7,000 inhabitants, and suggests a population minimum for the whole province of 40,000. However, as Gorecht, Westerwolde and the in later the following centuries partly flooded Oldambt (together calculated at 14,200 in 1509) are missing, this last estimate seems much too low. Taking into account the suggestion that the Groningen population did not increase in the fourteenth and fifteenth century, a very rough estimate of 50,000 for the total population of the province seems appropriate (with an estimated population of 5,500 living in the two cities). From 1509 onwards the countryside has been split into the old entities: Hunsingo, Fivelingo, Westerkwartier, Oldambt, Gorecht and Westerwolde, as we have separate estimates for all of them for that year (Schroor 2008, p. 26), and also for 1606 (Matthey 1975, p. 246, 251, with some corrections to allow for the interpolation of fiscal hearths in the 17<sup>th</sup> and 18<sup>th</sup> century). From 1702/4 tot 1785/9 we know for nearly every 5 year the development in the number of taxable hearths in Hunsingo, Fivelingo, Westerkwartier and Oldambt (Matthey 1975, p. 245). Taking into account the general increase in taxable hearths in the Groningen clay area between 1790 and 1795 (largely identical with Hunsingo, Fivelingo and Westerkwartier: Paping 1995, p. 311), we can estimate their population in 1790 and extrapolate this backwards to 1702.

As we have only a figure for Gorecht for 1606 (2,100), and this region also largely consisted of peat colonies, developing from about 1627 onwards, we assumed a constant percentage increase between 1627 and 1790 (the last figure is estimated from 1795 using the development of taxable hearths in nearby Oldambt, just like Oldambt itself). For Westerwolde we have information on the number of houses for 1568, 1572, 1578, 1588, 1592, 1609, 1621, 1628 1638, 1648, 1663, 1717, 1720, and 1795 (Oorschot 1992, p. 9-14), that has been used to extrapolate the 1795 census figure. Unfortunately, Oude Pekela, a peat colony starting in 1599, was not included in any of these figures. The population of this parish had been assumed to rise from 0 in 1598 tot 500 in 1605/6 and 3,000 in 1660, and to remain stable afterwards (1795: 2,972 inhabitants). Jansen (1976, p. 128) suggests a population number of 70,000 for the province as a whole at the start of the Spanish period (about 1560), which is not far from our present estimate of 66,000 in that year.

### *Holland*

Holland was split in north and south of the IJ in the early-modern period. The region north of the IJ has again been split in three to four parts (the Zaan region, Noorderkwartier, Western-Friesland and the rest (mainly Texel). Van der Woude (1972, see also 1980, p. 131) offers

numerous complete but also often fragmentary figures that have been used to make estimates for the countryside of the northern region, sometimes extrapolating developments in only part of the regions (supplemented with Lesger 1990, p. 217-223). The result were estimates for 1477, 1494, 1514, 1561, 1569, 1622, 1630, 1650, 1731, 1742, 1747, 1750 and 1795. The information for the more populous part of Holland south of the IJ is unfortunately less rich. Van der Woude (1972, p.193) mentions figures for 1514, 1622, ca. 1680, ca. 1750 and 1795 for the whole region (including the cities that have been deducted using the separate estimates).<sup>18</sup> Van Bavel and Van Zanden (2004, p. 505) also offer estimates for the whole of rural Holland for the years 1300, 1348, 1369, 1400 and 1575 (split between south and north of IJ according to the proportion in the other years). We raised the figures for 1400 and 1575 with 4% for missing parts of Holland.

It has to be remarked that Nusteling (1985, p. 248) also mentions for Holland as a whole, next to an identical figure for 1622, some extra estimates for 1670 (very rough: 916,000 compared to our 876,000) and around 1735 (926,000 compared to our 848,000). We did not use the Nusteling figures because of the large discrepancy with the 1750 estimate of Van der Woude (1980): 783,000. These differences are, however, disturbing as they show the large uncertainty of the Holland estimates that form a very large part of the whole estimate in this paper.

### *Limburg*

Because of many changes of boundaries for several municipalities due to the amputation of Belgium and changes in frontiers with Prussia (Germany: the population figures for Limburg before 1849 a) are not very reliable. By comparing the numerous municipal figures for several years (published in Philips 1963; De Kok 1964; Ramaer 1931) we have made new estimates for the previous census-years: 195,655 inhabitants end of 1839 and 185,156 end of 1829. For end 1814 we estimate the total population of the later Dutch province of Limburg at 156,511, for 1809 at 161,305, for 1806 at 159,124 and for 1796 at 140,557 (mainly based on Philips 1963, as the Ramaer 1931 figures mostly seem to relate tot 1801).

For the period before 1795 we have information on the development of the rural population in several parts covering nearly 80% of the population: the northern and southern part of Limburg, but also the surroundings of Sittard and the villages Tegelen and Kerkrade. Usually only information on the development of the population (mostly based on Roman-Catholics going to the holy communion) were available for part of the villages in several years in the seventeenth and eighteenth century (Philips 1975; Roebroek 1967; Engelen 1977; Engelen 1990). Very fragmentary evidence for the fifteenth and sixteenth century was available from Van Schaik (1987).

### *North-Brabant*

At the moment the population of the whole of the North-Brabant countryside has been estimated using estimates for the development of the countryside of the Meierij of Den Bosch only covering 53% of the population in 1795. These estimates are being based on Van Xanten (published in Faber e.a. 1965, p. 102-108). He gives a figure for 1374 of 46,000 for the countryside (including small towns) and 14,000 for Den Bosch. Annual growth rates for the countryside are stated to have been 0.64% between 1374 and 1464, between 1464 and 1496 population experienced an annual decrease of 0.84%, while between 1496 and 1526 it increases again 1.26% annually. For 1665 again a number of 94,000 is mentioned for the countryside. Between 1665 and 1766 the rural population grew 0.11% annually and from 1766 tot 1795 4.5% annually. Van Xanten en Van der Woude (1965) estimate the population

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<sup>18</sup> Compare De Vries (1974, p. 86) offering for 1514, 1622 and 1795 nearly exactly the same figures.

of the whole of the Meijerij in 1700 at more than 110,000 (including Den Bosch with 12,500). Our estimation procedure results are with nearly 98,000 for the Meijerij (excluding Den Bosch) well in accordance with this estimate. The present estimates for North-Brabant in this paper are still preliminary, as there seem also possibilities to estimate the population development also for the other half of the Brabant countryside. Kappelhof (2004, p. 530) mentions 148,895 inhabitants in 1665 and 181,158 in 1795 in the rural part (including some small towns) of staats-Brabant (a large part of North-Brabant): an increase of 21.7%, while we calculated an increase of 24.7 in this period based on the development from 94,000 in 1665 to 119,646 in 1795 in the countryside of the Meierij only. Also there is additional information on the development in an important different part of North-Brabant: the Baronie of Breda (for instance: Klep 1973).

### *Overijssel*

Overijssel was historically split in three parts Salland, Twente and area around Vollenhove. Most estimates are based on Slicher van Bath (1957) again presented in Faber e.a. (1965) who delivers figures from 1475 onwards for all three parts. The population of the small towns that have been included in the rural figures have been deducted using the city estimates. From 1599 onwards, however, we used new estimates of Trompetter (1997, p. 43, 81-82, 161-167). For 1570 we assumed that all later abandoned places were still occupied. For the years 1475-1499 we still used still the estimates of Slicher van Bath (1957, p. 54-55) for rural Twente. This results in a population number of 7,636 plus about 300 for missing Diepenheim in 1475. The estimates for 1495 and 1499 are the result of extrapolating the figure of 1475 using the development in households. The consequence of these estimates is a very rapid population growth between 1499 and 1570 from 6,700 to 18,100. Although we also see a very high population-growth in similar Drenthe in this period, the total increase in Twente might be overestimated. The high growth is mainly the consequence of the much higher estimates for 1600 of Trompetter and accordingly also for the beginning of the Dutch eighty-year war (1568-1648) in comparison with Slicher van Bath. In the following table we compare the estimates for Twente using also Trompetter, in comparison with only using Slicher van Bath's figures:

	1475	1499	1570	1600	1675	1723	1795
Trompetter	(20)	(16)	43	33	43	72	100
Slicher van Bath	20	16		23	38	61	100

The development of the countryside of Salland for the period 1397-1748 has been re-estimated using the development in the number of households (Slicher van Bath 1957, p. 33), and the average household-size in 1748. For the estimate of 1764 we used the average household-size in 1795. The development of the whole of the countryside of Overijssel for the period 1400-1475 has been estimated using the development in Salland in this period.

### *Utrecht*

The years 1580, 1630, 1750 and 1795 are derived from Rommes (1997, p. 171) with a correction for the different size of the province. Rommes (1997, p. 18-19) also offers a rough estimate for 1510 of 47,000-53,000, using the average and taking in account corrections for different boundaries. He estimates the estimated urban population to be more than 33,200 in the same year from other sources. This would imply that the rural population of Utrecht increased from 13,800/19,800 to 27,600 between 1510 and 1580. At the same time Rommes mentions a maximum of 20,000 for the Utrecht countryside. On a part of this countryside the population increased from a maximum of 9,500 in 1510 tot 21,000 in 1632/33 (Rommes 1997, p. 19). If we assume the same development for the whole Utrecht countryside, this

would result in a population number of 16,500 in 1510, a figure that we have used in our estimate. Jan de Vries (1974, p. 97-98) offers also estimates for the countryside of Utrecht, that cover a slightly different surface: 1632 33,067 (our estimate 36,445); 1748 41,865, based on 5 inhabitants per house (our estimate 38,943); 1795 46,680 (our estimate 49,131). These figures suggest a much lower growth between 1748 and 1795, and a correspondingly higher growth before 1748. We, however, have chosen to use the more recent estimates of Rommes (1997). De Vries (1974) also presents developments in the number of houses in a limited sample of Utrecht villages which increased from 391 (1540), to 659 (1600) and 991 (1748). This would suggest an increase of 153% between 1540 and 1748, much higher than the 89% increase in our calculations based on Rommes in the same period.

### *Zeeland*

Priester (1998, p. 484) gives as the population number in 1795 110,929 inhabitants (taking into account a calculation mistake: this will be 111,016) for this province. This figure differs seriously from the older numbers given by Oomens (1989: 114,638) and Hofstee (1981, p. 125: 114,616, in accordance with Ramaer 1931, p. 258) for that same year. The difference of about 3,600 inhabitants nearly only originates from the use by Priester of more recent figures for Zeeuws-Vlaanderen from detailed research of Van Cruiningen (partly published 2000, p. 386-387, 390). We have chosen to use the more recent figures of Priester (1998, p. 474) as the Ramaer figures for Zeeuws-Vlaanderen presumably relate to censuses of 1800 and 1806 and seem less reliable.

Priester (1998, p. 485) presents estimates of the rural population of Zeeland (excluding Zeeuws Vlaanderen) for 1601, 1626, 1680, 1767/8 and 1786, which also include the smaller towns. Taking into account the separate estimates of those towns we can calculate the rural population for those years. Partly the development of zuid-Beveland has been estimated separately, as we have extra information on the year 1622 and 1747 for this part (Priester 1998, p. 486).

For the oldest period we only dispose of estimates for the whole of Zeeland (excluding Zeeuws-Vlaanderen for 14000 (25,000) and 1520 and 1590 (36,000) (source \*\*\*), that after deduction of the urban population have been used to estimate the rural population.

Problematic is the development of the population of Zeeuws-Vlaanderen, as we only have information from the end of the seventeenth century onwards (Van Cruiningen 2000, p. 383-386, 390 for the west; Priester 1998, p. 484 for the east), we estimated these separately for the eastern (figures for 1698 and 1747/8) and the western (figures 1688, 1698 and 1748) part. For one third of the eastern part (Hulsterambacht) we have more information for intervening years (1688, 1698, 1739, 1747, 1756, 1765, 1770 and 1775). For the years before 1688 rural Zeeuws-Vlaanderen has been assumed to develop in accordance with the rest of rural Zeeland.

## Appendix C: Provisional population estimates of Dutch provinces 1400-1850

### Cities

	1400	1450	1500	1550	1600
Drenthe	500	600	600	700	700
Friesland	11,000	13,000	16,000	20,000	30,000
Gelderland	33,000	35,000	39,000	44,000	45,000
Groningen	6,000	8,000	12,000	14,000	19,000
Limburg	24,000	26,000	29,000	34,000	33,000
North-Brabant	37,000	37,000	41,000	46,000	48,000
North-Holland	29,000	41,000	45,000	74,000	151,000
Overijssel	21,000	24,000	26,000	32,000	28,000
South-Holland	45,000	64,000	78,000	86,000	126,000
Utrecht	19,000	23,000	29,000	37,000	38,000
Zeeland	28,000	28,000	30,000	33,000	45,000
<b>Total Netherlands</b>	<b>250,000</b>	<b>300,000</b>	<b>345,000</b>	<b>420,000</b>	<b>560,000</b>

	1650	1700	1750	1800	1849
Drenthe	800	800	900	1,400	2,200
Friesland	39,000	41,000	40,000	42,000	57,000
Gelderland	46,000	50,000	53,000	59,000	96,000
Groningen	22,000	22,000	23,000	26,000	36,000
Limburg	37,000	34,000	31,000	39,000	56,000
North-Brabant	43,000	43,000	47,000	51,000	82,000
North-Holland	291,000	335,000	294,000	276,000	296,000
Overijssel	35,000	34,000	42,000	45,000	76,000
South-Holland	212,000	231,000	203,000	206,000	298,000
Utrecht	45,000	41,000	41,000	50,000	72,000
Zeeland	49,000	54,000	54,000	48,000	59,000
<b>Total Netherlands</b>	<b>820,000</b>	<b>885,000</b>	<b>830,000</b>	<b>844,000</b>	<b>1,131,000</b>

### Countryside

	1400	1450	1500	1550	1600
Drenthe		(10,000)	(13,000)	17,000	18,000
Friesland			(60,000)	75,000	96,000
Gelderland	79,000	86,000	88,000	87,000	91,000
Groningen	(45,000)	(45,000)	46,000	50,000	56,000
Holland	144,000	149,000	154,000	188,000	257,000
Limburg	(51,000)	46,000	50,000	58,000	67,000
North-Brabant	(94,000)	131,000	114,000	161,000	165,000
Overijssel	(23,000)	(26,000)	29,000	28,000	36,000
Utrecht			(16,000)	22,000	31,000
Zeeland	(33,000)	(38,000)	(44,000)	(46,000)	43,000

<b>Total Netherlands</b>	<b>550,000</b>	<b>605,000</b>	<b>615,000</b>	<b>730,000</b>	<b>860,000</b>
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	<b>1650</b>	<b>1700</b>	<b>1750</b>	<b>1800</b>	<b>1849</b>
<b>Drenthe</b>	<b>23,000</b>	<b>29,000</b>	<b>34,000</b>	<b>39,000</b>	<b>81,000</b>
<b>Friesland</b>	<b>123,000</b>	<b>93,000</b>	<b>98,000</b>	<b>123,000</b>	<b>190,000</b>
<b>Gelderland</b>	<b>98,000</b>	<b>115,000</b>	<b>137,000</b>	<b>172,000</b>	<b>275,000</b>
<b>Groningen</b>	<b>67,000</b>	<b>81,000</b>	<b>74,000</b>	<b>94,000</b>	<b>153,000</b>
<b>Holland</b>	<b>330,000</b>	<b>316,000</b>	<b>307,000</b>	<b>311,000</b>	<b>445,000</b>
<b>Limburg</b>	<b>76,000</b>	<b>75,000</b>	<b>89,000</b>	<b>110,000</b>	<b>149,000</b>
<b>North-Brabant</b>	<b>169,000</b>	<b>175,000</b>	<b>182,000</b>	<b>221,000</b>	<b>314,000</b>
<b>Overijssel</b>	<b>34,000</b>	<b>52,000</b>	<b>81,000</b>	<b>92,000</b>	<b>140,000</b>
<b>Utrecht</b>	<b>37,000</b>	<b>38,000</b>	<b>39,000</b>	<b>51,000</b>	<b>77,000</b>
<b>Zeeland</b>	<b>47,000</b>	<b>47,000</b>	<b>46,000</b>	<b>62,000</b>	<b>102,000</b>
<b>Total Netherlands</b>	<b>1,005,000</b>	<b>1,020,000</b>	<b>1,085,000</b>	<b>1,276,000</b>	<b>1,926,000</b>

## **Appendix D: Provisional estimates of total Dutch population and of urbanisation-rates for inland and coastal regions per decennium 1400-1849**

	<b>Total Dutch population (thousands)</b>	<b>Dutch urbanisation rate (%)</b>	<b>Coastal urbanisation-rate (%)</b>	<b>Inland urbanisation-rate (%)</b>
<b>1400</b>	<b>800</b>	<b>32</b>	<b>30</b>	<b>33</b>
<b>1410</b>	<b>819</b>	<b>32</b>	<b>31</b>	<b>33</b>
<b>1420</b>	<b>840</b>	<b>32</b>	<b>32</b>	<b>33</b>
<b>1430</b>	<b>860</b>	<b>33</b>	<b>32</b>	<b>33</b>
<b>1440</b>	<b>882</b>	<b>33</b>	<b>33</b>	<b>32</b>
<b>1450</b>	<b>905</b>	<b>33</b>	<b>35</b>	<b>32</b>
<b>1460</b>	<b>932</b>	<b>33</b>	<b>36</b>	<b>31</b>
<b>1470</b>	<b>945</b>	<b>34</b>	<b>37</b>	<b>31</b>
<b>1480</b>	<b>948</b>	<b>35</b>	<b>38</b>	<b>32</b>
<b>1490</b>	<b>943</b>	<b>35</b>	<b>36</b>	<b>34</b>
<b>1500</b>	<b>961</b>	<b>36</b>	<b>37</b>	<b>35</b>
<b>1510</b>	<b>994</b>	<b>36</b>	<b>37</b>	<b>35</b>
<b>1520</b>	<b>1,045</b>	<b>36</b>	<b>38</b>	<b>35</b>
<b>1530</b>	<b>1,091</b>	<b>36</b>	<b>38</b>	<b>34</b>
<b>1540</b>	<b>1,119</b>	<b>36</b>	<b>38</b>	<b>34</b>
<b>1550</b>	<b>1,151</b>	<b>36</b>	<b>39</b>	<b>34</b>
<b>1560</b>	<b>1,195</b>	<b>37</b>	<b>39</b>	<b>34</b>
<b>1570</b>	<b>1,225</b>	<b>37</b>	<b>40</b>	<b>34</b>
<b>1580</b>	<b>1,280</b>	<b>37</b>	<b>41</b>	<b>33</b>
<b>1590</b>	<b>1,347</b>	<b>38</b>	<b>43</b>	<b>32</b>
<b>1600</b>	<b>1,422</b>	<b>40</b>	<b>45</b>	<b>32</b>

1610	1,505	41	46	32
1620	1,602	42	48	32
1630	1,690	42	48	32
1640	1,755	44	50	32
1650	1,823	45	52	32
1660	1,854	46	53	32
1670	1,892	47	55	32
1680	1,887	47	55	31
1690	1,897	47	56	30
1700	1,907	46	56	30
1710	1,923	46	56	29
1720	1,942	46	57	28
1730	1,957	46	57	28
1740	1,918	44	55	28
1750	1,916	43	54	28
1760	1,933	43	53	28
1770	1,963	42	52	27
1780	2,003	41	52	27
1790	2,050	41	51	27
1800	2,120	40	50	26
1810	2,206	39	49	27
1820	2,353	39	48	28
1830	2,636	38	47	27
1840	2,878	38	46	28
1849	3,057	37	46	27

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